

Using TrueAllele® Casework to Separate DNA Mixtures of Relatives

California Association of Criminalists
October, 2014
San Francisco, CA

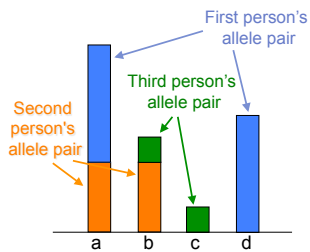
Jennifer Hornyak, MS, William Allan, MS,
and Mark W Perlin, PhD, MD, PhD
Cybergenetics, Pittsburgh, PA



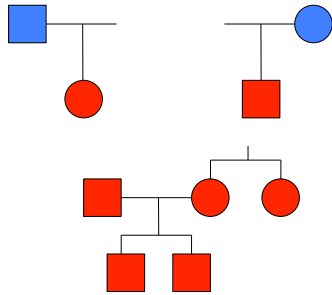
Cybergenetics

Cybergenetics © 2003-2014

Relatives share alleles



Cybergenetics experience

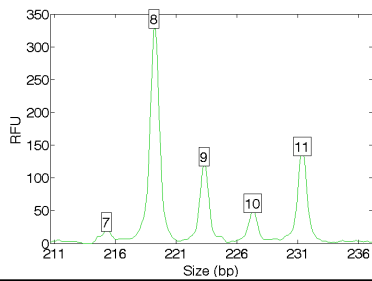


Pennsylvania v James Yeckel, Jr.

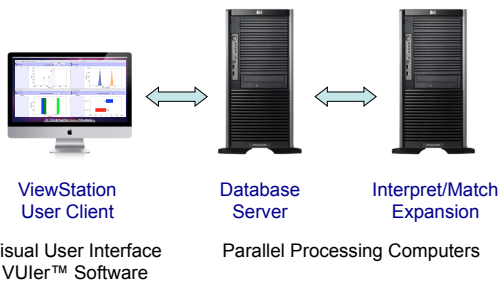


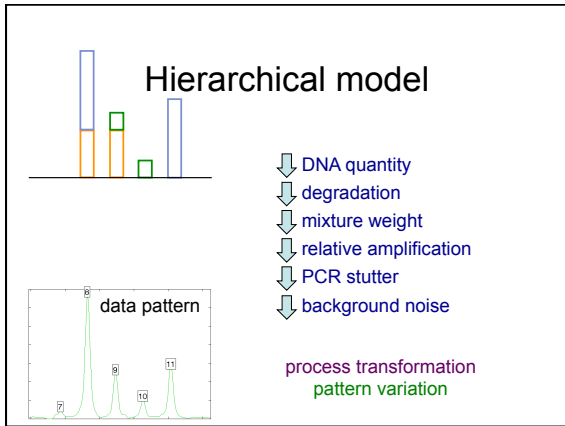
STR data

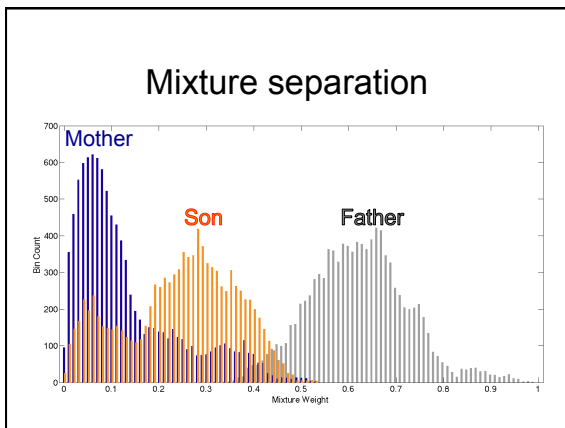
Quantitative peak heights at locus D7S820

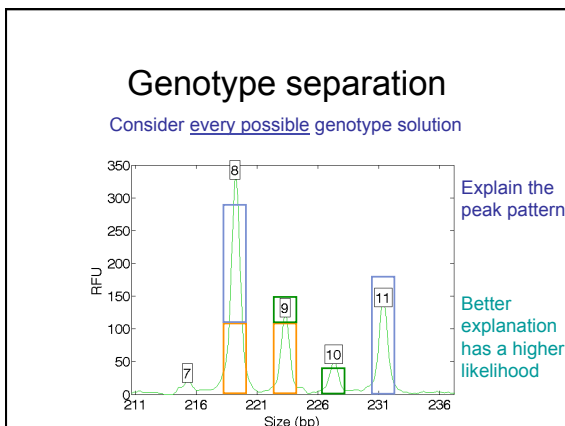


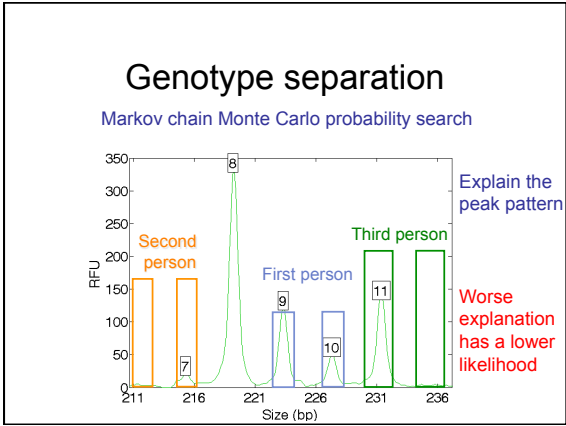
TrueAllele® Casework

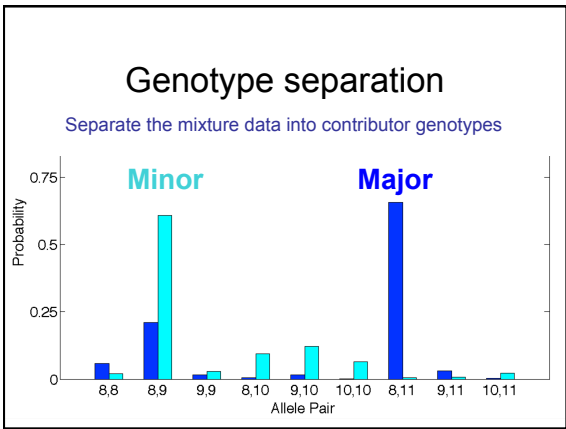


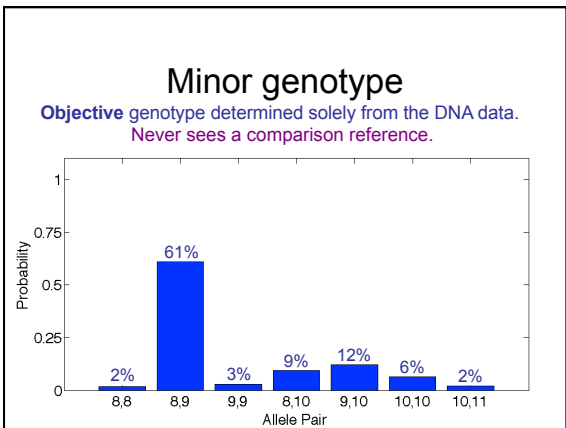


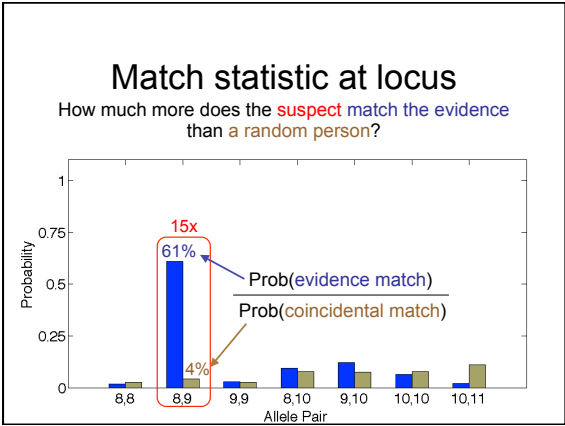












Reported match statistic

Multiply together the LR's at every locus

A match between the **shotgun shell** and **James Yeckel, Jr.** is **6.13 trillion** times more probable than a coincidental match to an unrelated **Caucasian** person

Published validation papers

Perlin MW, Sinelnikov A. An information gap in DNA evidence interpretation. *PLoS ONE*. 2009;4(12):e8327.

Ballantyne J, Hanson EK, Perlin MW. DNA mixture genotyping by probabilistic computer interpretation of binomially-sampled laser captured cell populations: Combining quantitative data for greater identification information. *Science & Justice*. 2013;53(2):103-14.

Perlin MW, Hornyak J, Sugimoto G, Miller K. TrueAllele® genotype identification on DNA mixtures containing up to five unknown contributors. *Journal of Forensic Sciences*. 2015; *in press*.

Greenspoon SA, Schiermeier-Wood L, Jenkins BC. Establishing the limits of TrueAllele® Casework: a validation study. *Journal of Forensic Sciences*. 2015; *in press*.

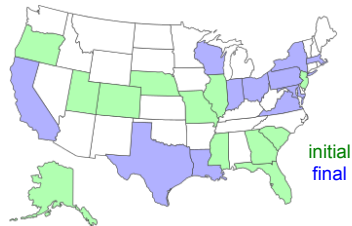
Perlin MW, Legler MM, Spencer CE, Smith JL, Allan WP, Belrose JL, Duceman BW. Validating TrueAllele® DNA mixture interpretation. *Journal of Forensic Sciences*. 2011;56(6):1430-47.

Perlin MW, Belrose JL, Duceman BW. New York State TrueAllele® Casework validation study. *Journal of Forensic Sciences*. 2013;58(6):1458-66.

Perlin MW, Dormer K, Hornyak J, Schiermeier-Wood L, Greenspoon S. TrueAllele® Casework on Virginia DNA mixture evidence: computer and manual interpretation in 72 reported criminal cases. *PLoS ONE*. 2014;(9)3:e92837.

TrueAllele in the United States

Laboratory systems or case reports in 23 states



TrueAllele in California



Case Report
Kern County, California, has two forensic labs. The first is the Kern County Sheriff's Office (KCSO), which is a 100% TrueAllele user. The second is the Kern County Sheriff's Office (KCSO), which is a 100% TrueAllele user. The article discusses the challenges of DNA mixture analysis and how TrueAllele helped resolve the crisis.

VICOR
www.vicor.com

© 2014 TrueAllele Systems, Inc.

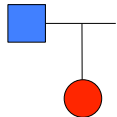
05/08/14

Court acceptance

- California
 - Louisiana
 - Maryland
 - New York
 - Ohio
 - Pennsylvania
 - Virginia
- United Kingdom
 - Australia

Appellate precedent in Pennsylvania

Father-daughter rape



A match between **the father's t-shirt** and **his daughter** is
10 quadrillion times more probable than coincidence

A match between **the daughter's bra** and **her father** is
5 million times more probable than coincidence

DNA without boundaries

Presentation

M.W. Perlin, "TrueAllele® interpretation of DNA mixture evidence",
Keynote talk, *9th International Conference on Forensic Inference and Statistics*, Leiden University, The Netherlands, 20-Aug-2014.

M.W. Perlin, "TrueAllele® Casework", *Almost Everything You Wanted to Know About Probabilistic Software (But Were Afraid to Ask)*,
Promega's Twenty Fifth International Symposium on Human Identification, Phoenix, AZ, 29-Sep-2014.

Webinar

M.W. Perlin, "How TrueAllele® Works, Part 1", *Cybergenetics Webinar Series*, Pittsburgh, PA, 16-Oct-2014.

More information

<http://www.cybgen.com/information>

- Courses
- Newsletters
- Newsroom
- Patents
- Presentations
- Publications
- Webinars



<http://www.youtube.com/user/TrueAllele>
TrueAllele YouTube channel



Cybergenetics



perlin@cybgen.com
